

*Agrotidae* sp. Fig. IV. Exp. 20 mm.—Forewing and hindwing a uniform warm brown; antennae clefted. Left valve divided into three distinct narrow arms, the outer arm heavily spined. Right valve broad, the two outer arms blunt, inner arm narrow, pointed. Sapucay, Paraguay W. Foster, 1902.

*Safia permixta*, Schaus. Fig. V. Exp. 20 mm.—Forewing dark brown, with silvery markings and dark cross stripes. Hindwing centre dark brown, termen to apex lighter in colour. Foreleg heavily scaled, having the appearance of a scent brush. Valves quite different in structure. Left valve divided into a broad (inner) arm, heavily spined, outer arm narrower. Right valve also divided into two arms, inner with some semblance to left but smaller and not spined, outer developed into a double-headed longer arm. Uncus, strongly chitinized into a very large hatchet-shaped head. N.E. Brazil, F. Birch, 1909.

*Lole exhausta*, Guen. Fig. VI. Exp. 24 mm.—Forewing greyish white, costa with three light brown patches at equal distance apart, between thorax and apex. Hindwing greyish white, medial line light brown and some spots. Foreleg holds a very large brush of long setae, which dissection shows to be a scent brush. Left valve normal shape, the clasper is large. Right valve larger and longer, developed into a roundish apex; ampulla a large round spinose knob. Uncus very large, mandibulate. Sapucay, Paraguay, W. Foster, 1902.

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EXPLANATION OF PLATE.

Male Genitalia of:

- Fig. I.—*Miselia oxyacanthae*, Europe.  
 Fig. II.—*Emmelina monodactyla*, Europe.  
 Fig. III.—*Euglyphia hieroglyphica*, Cram., Brazil.  
 Fig. IV.—*Agrotidae* sp., Paraguay.  
 Fig. V.—*Safia permixta*, Schaus., Brazil.  
 Fig. VI.—*Lole exhausta*, Guen., Paraguay.

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EARLY STAGES OF ORIENTAL PALAEARCTIC LEPIDOPTERA.  
 VII.

By E. P. WILTSHIRE, F.R.E.S.

(Plate IV.)

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(The two preceding articles in this series were "Early Stages, etc. V." and "Some more new Lepidoptera from S.W. Iran, with their life histories," which was equivalent to the sixth; they appeared in *Journ. Bombay N.H. Soc.*, Vols. xliii, xlv, April and December 1943, respectively.)

RHOPALOCERA, LYCAENIDAE.

*Tarucus balcanicus*, Freyer, ssp. *areshanus*, B.-Baker (Fig. G.).

*Larva*:—Full-grown: 10 mm., wood-louse-like, bright green, just matching the underside of the fresh nebek leaf. A creamy white dorsal line begins on the posterior half of the enlarged first somite; here it is broadest and has a red-brown centre; this reddish colour is only to be

seen on somites 1-3. The dorsal line is interrupted at each somite by a pale green wrinkle. Head, hidden under somite 1. Sublateral line, just above "lappets," wavy and faint whitish-green. Hairs downy, short, white.

*Pupation*:—On 16th October the larva ceased feeding, and was found on the lid of the tin, turning purple on somite 1. On the 19th it took up a new position in the bottom corner of the tin; it was now transparent, dusky grey-green, with pale lines still visible. It pupated on the evening of the 19th October. A male butterfly emerged from this pupa on 27th October.

*Pupa*:—At first green, with purple-red dorsal line. On 20th October it had turned black and brown.

*Foodplant*:—*Zizyphus spina-christi* ("nebek") at Basra. In the Kurdish mountains and in the Anti-Lebanon the butterfly is associated with *Paliurus spina-christi*, *Zizyphus* being absent. The larva eats "windows" on the underside of the "nebek" leaf. The above larva was found surrounded by small ants on its foodplant; it was then full-grown but still feeding. The butterfly is continuously-brooded.

#### HETEROCERA, AGROTIDAE, QUADRIFIDAE.

##### *Hypoglaucitis benenotata*, Warr. (Figs. F., J.).

This genus is placed just before *Clytie*, and the larva shows great likeness to *Clytie* larvae both in structure and foodplant (*Tamarix*). I have already published an account of the early stages of several kinds of *Clytie*, as follows:—

*sancta*, Stgr., *Ent. Rec.*, July-August 1935.

*syriaca*, Bugn., *delunaris*, Stgr., and *terrulenta*, Christ., all in *Mitt. Muench. Ent. Ges.*, 1939, Heft 1.

*distincta*, B.-H., ssp. *iranica*, Brandt. in "Early Stages . . . V." mentioned above.

All these larvae differ from the *Hypoglaucitis* in one respect: *benenotata* retains its green colouring even in the last instar, whereas they turn brown in the penultimate or an earlier. This change is accompanied by a change in habit, the green forms resting among the green "needles," the brown forms resting on the twigs or branches or trunk.

The larva of *benenotata* is a good example of a coloration-type illustrated in my 1939 article mentioned above, and which is especially found in larvae attached to tamarisks and conifers. These larvae are taxonomically unrelated to each other, and the foodplants are also taxonomically distant from one another; the only apparent common feature in the foodplants are their similar appearance, green needles replacing broad, flat leaves. This would seem to be a case of what has been called "visual adaptation," in which neither chemistry nor heredity play a perceptible part.

*Full-grown larva*:—Green, long, tapering, with first pair of claspers rudimentary (see plate), with white longitudinal markings not unlike those of the penultimate instar of *delunaria*. The differences are: (a) The white spiracular lines are uninterrupted; (b) the purer white subdorsal line is almost or quite uninterrupted; (c) there are no traces of a double white dorsal line at all; (d) somites 8-11 bear a slight ochreous-brown discoloration, which in some forms extends so as to

suffuse the whole dorsal area with gold-brown, except at somital joints, which remain green; this "brown form" (Fig. J.), however, is not brown elsewhere, being green laterally and ventrally; in it the fine lateral line has a clearer dark almost blackish wavy double edging and is only white near the head. In the more normal green form this fine lateral line is white throughout; there is also some very faint white longitudinal pencilling in the green ground colour laterally. Somite 8 is slightly swollen dorsally. Spiracles yellow, black-rimmed, set on the top edge of the spiracular line. In the green form there is a slight tendency to ochreous in the somital joints except on somites 8-11. Under-side countershaded, paler milky green. Head green, with white longitudinal continuations of the body lines.

*Foodplant*:—Tamarisk (*T. articulatus*).

*Localities and date*:—Zubeir and Basra, S. Iraq, 1943. Imagines were bred or caught from early April to late June, and again in November; one example was taken at Ahwaz, Khuzistan, S.W. Persia, on 2nd October 1938. There seems little doubt that this moth is continuously-brooded, possibly with a retardation in midsummer. It does not appear to penetrate Central and Northern Iraq and Iran. The same can be said of the foodplant recorded above, which is planted in oases widely over Arabia.

*Thermesia arefacta*, Swinh. (Fig. H.).

*Ovum*:—Bun-shaped, brown, with faint concentric circles of fine white dots, only visible under a lens; laid singly; period (in April at Basra), 6-7 days.

*Larva*:—When freshly hatched, thread-like, active, dark-brown. In the second and third instars, dark brown with paler longitudinal stripes; many have a well-marked double dusky ventral line. Full-grown: tapering, slender, with only three pairs of claspers (see plate); sandy-ochreous, the somital joints infused with a warmer rust colour. Dorsal line double, pale. Longitudinal lines pale yellowish. Subdorsal is pale, single, fainter than the dorsal. A greyish mottled subdorsal area contains two dark grey wavy lines. There are many faint slightly wavy lateral lines, ochreous above but darker grey just above the spiracles. Spiracular stripe pale. Spiracles black-rimmed. Sublateral and ventral area counter-shaded, paler, with very faint fine wavy lines. Head ochreous grey, with paler lines and a darker inverted V-mark. Legs and claspers of ground colour, but claspers sometimes marked laterally with black. On posterior part of somite 4, two subdorsal stigmata, marked in black, sometimes conspicuous.

*Pupa*:—Glossy, light red-brown, in slight cocoon among leaves or low herbage.

*Foodplant*:—*Prosopis stephaniana*; in Basra the larvae also fed up readily on the imported ornamental tree *Acacia farnesiana* but none of these pupated successfully. The pupal period observed at Bagdad in September was 9 days, and the moths emerged in the evening. The moth flies by day; also at dusk; is sometimes to be found at night settled on its foodplant. Appears to be an oasis moth, haunting irrigated ground and rank riverside vegetation.

## GEOMETRIDAE.

*Boarmia tenuisaria*, Stgr. (Fig. K.).

*Larva*:—Grey or greenish grey, paler below; fairly stout; somites 4, 8, 9, and 11 each have a pair of dorsal warts on the anterior half, the pair on 9 being smaller than the others. Dorsal chain rather as in the genus *Catocala*, i.e., composed of two paler outer strands which unite or form islands in their course down the back. Subdorsal lines fine, double, grey, suffused with reddish-brown, the grey deepening to black in the vicinity of the paired warts. Spiracles small, grey, black-rimmed. Underside: ventral line, blackish between the claspers; on somites 4-8 a broad whitish grey-edged stripe, with outer edges more parallel than those of the dorsal chain, and marked with black stigmata near the somital joints; this stripe contains a grey-edged ventral stripe which widens and narrows slightly in its course. Size, full-grown, 1 inch. The larva buries to pupate.

Pupation takes place in early April in the Basra district, and the moth flies there throughout November. The male comes to light in the vicinity of the foodplant, *Lycium barbarum*. It seems to be an oasis moth. The foodplant is leafless in summer and autumn and comes out in leaf about January-February.

## KEY TO PLATE.

One plate illustrates the two articles, "Middle East Lepidoptera: New forms and species, VI," and "Early stages of Oriental Palaeartic Lepidoptera, VII."

*N.B.*—The enlargement of the insects is not uniform; the printed scale shown is metric, the figures representing centimetres.

Figs. A.-E. illustrate "Middle East Lepidoptera: New forms and species. VI."

Fig. A. *Boarmia ghirshmani*, sp. n.

B. *Boarmia tenuisaria*, Stgr., ♂.

C. *Boarmia tenuisaria*, Stgr., ♀, ne-allo-TYPE.

D. *Chondrostega subfasciata brunneicornis*, subsp. n.

E. *Autophila cymaenotaenia* ssp. *orthotaenia*, subsp. n.

Figs. F.-K. illustrate "Early stages of Oriental Palaeartic Lepidoptera, VII."

Fig. F. Green form, larva, *Hypoglaucitis benenotata*, Warr.

G. Larva, *Tarucus balkanicus* ssp. *areshanus*, B.-Baker.

H. Larvae, *Thermesia arefacta*, Swinh.

J. Brown-marked form, larva, *Hypoglaucitis benenotata*, Warr.

K. Larva, *Boarmia tenuisaria*, Stgr.

## PSODOS CORACINA.

## DISCOVERY AND DESCRIPTION OF FULL-GROWN LARVA.

On 29th April 1943, while searching for pupae or larvae of *P. alpina* about 2500 feet up on a mountain at Aviemore, my wife and I turned up three geometrid larvae. From their similarity to the larva of *G. obscurata* I suspected them to be those of *P. coracina*. I sent a rough description to Dr Cockayne, who confirmed my suspicion and told me